

PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference TS9284 PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/00585	International filing date (day/month/year) 21.01.2003	Priority date (day/month/year) 23.01.2002	
International Patent Classification (IPC) or both national classification and IPC C08K5/20, C08K5/20			
Applicant SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 16.07.2003		Date of completion of this report 16.04.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Niaounakis, M Telephone No. +31 70 340-3818 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/00585

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1, 2, 5, 7, 8, 10-14	as originally filed
3, 4, 6, 9	received on 27.12.2003 with letter of 19.12.2003

Claims, Numbers

1-10	received on 27.12.2003 with letter of 19.12.2003
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/00585**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	2-10
	No: Claims	1
Inventive step (IS)	Yes: Claims	10
	No: Claims	1-9
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/00585

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

While the Applicant's observations submitted with an amended set of claims have been carefully considered, the previous expressed opinion is nevertheless maintained for the following reasons:

Reference is made to the following document:

D3: PATENT ABSTRACTS OF JAPAN vol. 013, no. 579 (C-668), 20 December 1989 (1989-12-20) & JP 01 242667 A (HITACHI CHEM CO LTD), 27 September 1989 (1989-09-27)

Document D3 relates to a road marking composition comprising 10-20% acid modified aliphatic petroleum resin, 0.5-5% plasticizer, 1-10% colouring pigment (titanium dioxide), 1-50% ethylenebislaureamide and 40-65% fillers.

As can be seen, D3 comprises all technical features of claim 1. Therefore, the composition itself is known. Although said composition is used as a road marking material, there is no indication, whatsoever why this composition is not suitable for use in synthetic asphalt. Apparently, an essential feature is missing from claim 1 to distinguish it from the prior art (Article 6 PCT). Therefore, the subject-matter of claim 1 is not considered to be novel (Article 33(1)(2) PCT).

Furthermore, claims 2-9 seem to lack inventive step as they do not require the exercise of an inventive skill in order to solve the problem posed.

Finally, the novelty and inventivity of claim 10 is acknowledged.

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JPA 2001-253988 describes a colouring resin having plate-out resistant characteristics. Plate-out is a phenomena associated with extrusion moulding which results in the formation of scratches and defects in the appearance of a moulding. The colouring resin of JPA 2001-253988 contains a styrene-based resin, a pigment, a fatty acid and a metal soap. The fatty acid amide and metal soap are added as dispersing agents to disperse the pigment uniformly in the resin, a specified ratio of amide to metal soap being required to prevent plate-out and to ensure that the pigment is uniformly dispersed. The colouring resins of JPA 2001-253988 are for use in extrusion moulding and would be unsuitable as binders in synthetic asphalt.

JPA 01-242667 relates to a road marking material that may be used in both hot and cold conditions. The marking materials of JPA 01-242667 contain a binder resin and a bisamide of specific melting point, the bisamide apparently being incorporated to improve the drying properties and contamination resistance of the material in hot conditions, and the cracking properties in cold conditions. JPA 01-242667 describes a road marking material: no mention is made of synthetic asphalt compositions or pigmentable binders for use therein.

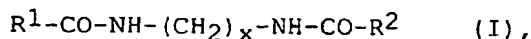
Summary of the invention

It has now surprisingly been found possible to lower the workability temperature of a pigmentable binder without adversely affecting its rheological properties, by incorporating into the binder a small amount of a particular type of amide additive.

Accordingly, the present invention provides a pigmentable binder composition for use in synthetic asphalt, which composition comprises a petroleum resin, a

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lubricating oil and/or a lubricating oil extract, and in the range of from 0.05 to less than 3 % wt based on total composition of an amide additive of general formula:



wherein R^1 and R^2 each independently represent alkyl groups having in the range of from 10 to 60 carbon atoms, and x is an integer in the range of from 1 to 4.

Detailed description of the invention

The pigmentable binder composition of the present invention preferably comprises in the range of from 1 to 70 % wt of a petroleum resin, more preferably 10 to 60 % wt, even more preferably 20 to 55 % wt, and most preferably 30 to 50 % wt, based on total composition.

Resins that may be conveniently utilised include petroleum resins prepared by polymerisation of unsaturated hydrocarbons present in unsaturated petroleum fractions, such as thermally cracked fractions and unsaturated hydrocarbons obtained from pyrolysis of hydrocarbons.

Preferably, the pigmentable binder of the present invention comprises an acidic resin having an acid value in the range of from 0.5 to 200 mg KOH/g, more preferably 1 to 100 mg KOH/g, and most preferably 1 to 50 mg KOH/g.

Preferred acidic resins according to the present invention are modified resins based on petroleum resins, said resins having been modified so as to comprise

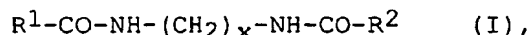
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Preferably, the lubricating oil and/or lubricating oil extract is a lubricating oil extract obtained by solvent extraction of a lubricating oil, most preferably by solvent extraction of a deasphalted oil (i.e. a lubricating oil obtained by the removal of asphaltenes from a residue of crude oil distillation). Lubricating oil extracts obtained by solvent extraction of a deasphalted oil are known in the art as Bright-Stock extracts, and may be obtained for example by solvent extraction of the deasphalted oil with phenol, N-methyl pyrrolidone, liquid sulphur dioxide, either alone or in combination with an aromatic compound, such as benzene, or furfural.

Most preferably the lubricating oil and/or lubricating oil extract is a Bright-Stock furfural extract.

Of course, known resin-lubricating oil combinations may be utilised in the composition of the present invention. A very suitable product is sold by the Royal Dutch/Shell Group of companies under the trade name "Mexphalte C".

The pigmentable binder composition of the present invention preferably comprises in the range of 0.1 to less than 3 % wt of an amide additive of general formula

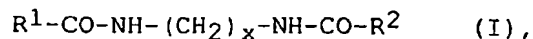


wherein R^1 and R^2 each independently represent alkyl groups having in the range of from 10 to 60 carbon atoms, and x is an integer in the range of from 1 to 4; more preferably in the range of from 0.1 to 2.5 % wt, even more preferably 0.1 to 2.0 % wt, and most preferably 0.1 to 1.5 % wt, based on total composition.

Preferably, R^1 and R^2 each independently represent alkyl groups having in the range of from 12 to 30 carbon

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invention further provides a synthetic asphalt comprising a mixture of aggregate and a pigmentable binder composition which comprises a petroleum resin, a lubricating oil and/or a lubricating oil extract, and in the range of from 0.05 to less than 3 % wt based on total composition of an amide additive of general formula:



wherein R^1 and R^2 each independently represent alkyl groups having in the range of from 10 to 60 carbon atoms, and x is an integer in the range of from 1 to 4.

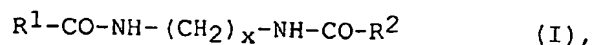
Preferred pigmentable binders described hereinabove with regard to the pigmentable binder of the invention are similarly preferred with regard to the synthetic asphalt of the invention.

The amount of pigmentable binder in the synthetic asphalt of the present invention may vary depending on the application for which the synthetic asphalt is to be used. For example, synthetic mastic asphalt compositions will typically contain a larger amount of binder than a continuously graded asphalt. However, the synthetic asphalt of the present invention preferably comprises in the range of from 1 to 15 % wt of pigmentable binder, based on total synthetic asphalt.

A wide range of aggregate type and size distribution may be present in the synthetic asphalt composition of the invention. Suitable aggregates include stones, sand and fillers such as mineral dust and ground limestone. Conveniently the aggregate employed in the synthetic asphalt of the present invention may be a combination of filler (particles having a particle size of less than 63 micrometers) and larger aggregates such as sand (particle sizes of from 63 micrometers to 2 mm) and stones

REVISED CLAIMS

1. Pigmentable binder composition for use in synthetic asphalt, which composition comprises a petroleum resin, a lubricating oil and/or a lubricating oil extract, and in the range of from 0.05 to less than 3 % wt based on total composition of an amide additive of general formula:



wherein R^1 and R^2 each independently represent alkyl groups having in the range of from 10 to 60 carbon atoms, and x is an integer in the range of from 1 to 4.

2. Pigmentable binder composition as claimed in claim 1, which further comprises a polymer.

3. Pigmentable binder composition as claimed in claim 1 or claim 2, wherein the resin is an acidic resin, having an acid value in the range of from 0.5 to 200 mg KOH/g.

4. Pigmentable binder composition as claimed in any one of claims 1 to 3 wherein the resin is a modified petroleum resin comprising carboxylic acid, carboxylic acid anhydride or hydroxyl groups.

5. Pigmentable binder composition as claimed in claim 4, wherein the resin is a modified petroleum resin obtainable by treating a petroleum resin with maleic anhydride.

6. Pigmentable binder composition as claimed in any one of claims 1 to 5, wherein the lubricating oil and/or lubricating oil extract is a Bright-Stock extract.

7. Pigmentable binder composition as claimed in any one of claims 1 to 6, wherein the amide additive of general formula (I) is an ethylene bis-stearamide.

8. Pigmentable binder composition as claimed in any one of claims 1 to 7, which comprises in the range of from 1 to 70 % wt of a petroleum resin; 20 to 97 % wt of a

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lubricating oil and/or a lubricating oil extract; 0.1 to less than 3 % wt of an amide additive of general formula (I); and optionally in the range of from 1 to 15 % wt of a polymer, all weights based on total composition.

9. Synthetic asphalt comprising a mixture of aggregate and a pigmentable binder as claimed in any one of claims 1 to 8.

10. Use of a pigmentable binder composition as claimed in any one of claims 1 to 8 in synthetic mastic asphalt.